

## PATENT COOPERATION TREATY

PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 01 JUN 2006

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Applicant's or agent's file reference P66651PC00		<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/NL2005/000078		International filing date (day/month/year) 04.02.2005	Priority date (day/month/year) 05.02.2004	
International Patent Classification (IPC) or national classification and IPC INV. C10G9/20 C10G9/36				
Applicant TECHNIP FRANCE				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand  05.12.2005		Date of completion of this report  31.05.2006		
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized officer  Deurinck, P  Telephone No. +31 70 340-2404		



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/NL2005/000078

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**Box No. I Basis of the report**

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1. With regard to the **language**, this report is based on
- ☒ the international application in the language in which it was filed
  - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
    - ☐ international search (under Rules 12.3(a) and 23.1(b))
    - ☐ publication of the international application (under Rule 12.4(a))
    - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

**Description, Pages**

1-23 as originally filed

**Claims, Numbers**

1-18 as originally filed

**Drawings, Sheets**

1/14-14/14 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	2, 8-18
	No: Claims	1,3-7
Inventive step (IS)	Yes: Claims	2,8-18
	No: Claims	1,3-7
Industrial applicability (IA)	Yes: Claims	1-18
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

Reference is made to the following documents:

D1: US 6 488 839

D2: US 3 641 190

D3: US 2 089 292

**1. Novelty**

**1.1**

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of independent **Claim 1** is not new in the sense of Article 33(2) PCT.

Document D1 discloses a method for steam cracking a hydrocarbon feed (see D1: column 1, lines 5-8) through a cracking coil in a firebox under cracking conditions (see D1: figures 2 and 3), wherein the coil comprises at least one outlet section and at least one inlet section and wherein the outlet section of said coil is more thermally shielded than the inlet section of said coil (see D1: figures 2 and 3 (6)).

Similar novelty objections can be made based on documents D2 (claim 1; Figure 1).

**1.2**

The present application meets the criteria of Article 33(1) PCT, because the subject-matter of independent **Claims 8 and 18** and dependent **Claim 2** is new in the sense of Article 33(2) PCT.

None of the prior art documents discloses a cracking furnace comprising the technical features as disclosed of Claims 2, 8 and 18 of the current application.

1.3

The following dependent Claims are also not new:

- **Claim 3:** see D1: Figure 2 and 3; column 4, lines 66-67; see D2: Figure 1;
- **Claim 4:** see D1: Figure 2 and 3; column 4, lines 66-67; see D2: Figure 1; see D3: Figure 1;
- **Claim 5:** see D1: column 8, lines 55-62; see D2: column 6, lines 38-40; see D3: claim 1;
- **Claim 6:** see D1: column 1, lines 5-15; see D2: column 4, lines 6-52;
- **Claim 7:** see D1: column 3, lines 6-7; see D2: column 1, lines 54-56;

1.4

**Claims 9-17** are dependent on independent Claim 8 and as such also meet the requirements of the PCT with respect to novelty.

2. Inventive Step

2.1

The present application meets the criteria of Article 33(1) PCT, because the subject-matter of independent **Claims 8, 18** and dependent **Claim 2** involves an inventive step in the sense of Article 33(3) PCT.

*Document D1*, which is considered to represent the most relevant state of the art, discloses a cracking furnace comprising a firebox provided with a plurality of cracking coils (see D1: Figure 2 (5)), said firebox comprising one lane of outlet sections of the coils (see D1: Figure 2 (JO)), one lane of inlet sections of the coils (see D1: Figure 2 (IJ)) and two lanes of burners (see D1: Figure 2 (6)), wherein the inlet section is located between the outlet section and the two lanes of burners (see D1: Figure 2).

The subject-matter of Claim 8 differs from D1 in that at least on lane of outlet sections is located between at least two lanes of inlet sections and the lanes of inlet sections are located in between at least two lanes of burners (*distinguishing feature*).

The *technical effect* that is achieved with this distinguishing feature is to improve the thermal stability (description page 9, line 27 - page 12, line 26).

The *problem to be solved* by the present invention may be regarded as: "To provide an improved furnace having an increased thermal stability".

The problem of increasing the thermal stability has been solved in a non obvious way. None of the available prior art documents discloses the specific arrangement of lanes as disclosed in Claim 8, nor does the prior art give a hint which could lead the skilled person to arrange the coils in such a way in order to improve the thermal stability.

Thus the subject-matter of independent Claim 8 involves an inventive step in the sense of Article 33(3) PCT.

A similar reasoning can be followed to conclude that the subject-matter of dependent Claim 2 and independent Claim 18 involves an inventive step in the sense of Article 33(3) PCT.

## 2.2

**Claims 9-17** are dependent on independent Claim 8 and as such also meet the requirements of the PCT with respect to inventive step.